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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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David R. Duncan

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EXAMINER

ROBINSON, KEITH O NEAL

ART UNIT

PAPER NUMBER

1638

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/708,724	Applicant(s) DUNCAN ET AL.	
	Examiner KEITH O. ROBINSON	Art Unit 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 9-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 16 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's withdrawal of claims 9-15, filed February 3, 2010, have been received and entered in full.

Claims 1-8, 16 and 17 are under examination.

Response to Arguments

Applicant's arguments, see page 6, paragraph B of 'Remarks' filed February 3, 2010, with respect to the 35 USC § 112, second paragraph rejection on page 2 of the Office Action mailed August 3, 2009 have been fully considered and are persuasive. The rejection has been withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

Art Unit: 1638

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-8, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Connor-Sanchez et al (Plant Cell Reports 21: 302-312, 2002), in view of Reichert et al (US Patent No. 6,140,555, October 31, 2000).

Claim 1 reads on a method of obtaining transformable callus tissue comprising (a) germinating a mature corn seed in tissue culture media containing an effective amount of an auxin and an effective amount of a cytokinin to produce a growing seedling containing a nodal section; (b) isolating said nodal section from said seedling; and (c) culturing said nodal section to produce embryogenic callus suitable for transformation.

Limitations include the auxin is picloram and the cytokinin is BAP (claim 2); the picloram concentration is between about 0.5 mg/L and about 20 mg/L (claim 3); the BAP concentration is between about 0.1 mg/L and about 10 mg/L (claim 4); the tissue culture media is solid (claim 5); the nodal section is obtained from the seedling between 3 and 30 days after germination (claims 6 and 7); transforming the callus with a nucleic acid sequence conferring a selected genetic trait to the transformed callus and regenerating a transformed plant from the transformed callus containing the nucleic acid sequence (claim 8).

Art Unit: 1638

O'Connor-Sanchez et al teach germinating mature corn seed in MS basal media supplemented with the cytokinin BA and the auxin 2,4-D (see page 303, 'Materials and methods', 1st column, 2nd paragraph).

O'Connor-Sanchez et al teach producing and transforming embryogenic-like callus (see, for example, page 303, 2nd column, 1st paragraph).

O'Connor-Sanchez et al teach the tissue culture media is solid (see, for example, page 303, 2nd column, 1st paragraph where it teaches all media were solidified with Gelrite).

O'Connor-Sanchez et al do not teach isolating the nodal section from the seedlings.

O'Connor-Sanchez et al do not teach culturing the nodal section on a callus induction media.

O'Connor-Sanchez et al do not teach the auxin is picloram and the cytokinin is BAP.

O'Connor-Sanchez et al do not teach the picloram concentration is between about 0.5 mg/L and about 20 mg/L.

O'Connor-Sanchez et al do not teach the BAP concentration is between about 0.1 mg/L and about 10 mg/L.

O'Connor-Sanchez et al do not teach the nodal section is obtained from the seedling between 3 and 30 days after germination (claims 6 and 7).

O'Connor-Sanchez et al do not teach transforming the callus with a nucleic acid sequence conferring a selected genetic trait to the transformed callus and regenerating

Art Unit: 1638

a transformed plant from the transformed callus containing the nucleic acid sequence (claim 8).

Reichert et al teach isolating the nodal section from the seedling and using it to initiate organogenic callus cultures. See column 3, lines 62-64 where it teaches “[s]eedling nodal tissues from inbred [corn] were excised”. It would have been obvious to one of ordinary skill in the art that in isolating nodal section one would have to excise tissue.

Reichert et al teach the use of the auxin picloram and the cytokinin BAP in culture media (see, for example, column 4, line 1 to column 5, line 56 and Table 2).

Reichert et al teach the picloram concentration of 3.0 mg/L, which is between about 0.5 mg/L and about 20 mg/L (see, for example, column 3, line 67 to column 4, line 1).

Reichert et al teach a BAP concentration of 2.0 mg/L, which is between about 0.1 mg/L and 10 mg/L (see column 5, line 55).

Reichert et al teach nodal section obtained from seedling 7 days after germination. See column 5, lines 52-56 where it teaches explant were excised after 7 days.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of Applicant's invention to combine the cited references to produce the claimed method.

O'Connor-Sanchez et al teach germinating mature corn seed in MS basal media supplemented with the growth regulators cytokinin BA and the auxin 2,4-D as well as producing and transforming embryogenic-like callus, as discussed above. O'Connor-Sanchez et al do not teach isolating and culturing nodal section from seedling to

Art Unit: 1638

produce embryogenic callus; however, as discussed above, Reichert et al teach isolating the nodal section from the seedling and that said nodal section is used to initiate organogenic callus formation and culturing nodal section on induction media.

Therefore, it would have been obvious to one of ordinary skill in the art to replace the teachings of O'Connor-Sanchez et al using shoot tips to produce embryogenic callus with the teachings of Reichert et al using nodal sections from seedling because the nodal sections taught by Reichert et al can be used to initiate organogenic callus and O'Connor-Sanchez et al teach organogenic callus can be induced to form embryogenic-like callus. Thus, it would have been obvious to substitute one method of yielding organogenic/embryogenic-like callus culture for another method.

The claimed elements are found within the scope and content of the prior art and one of ordinary skill in the art would have had the ability to combine the elements as claimed by methods known at the time the invention was made. Thus, one of ordinary skill in the art would have recognized at the time the invention was made that the capabilities or functions of the combination were predictable.

Claim 16 reads on a method of obtaining transformable callus tissue comprising (a) priming a mature corn seed; (b) germinating a mature corn seed in tissue culture media containing an effective amount of an auxin and an effective amount of a cytokinin to produce a growing seedling containing a nodal section; (c) isolating said nodal section from said seedling; and (d) culturing said nodal section to produce embryogenic callus.

O'Connor-Sanchez et al teach priming mature corn seed by soaking seed in bidistilled water for 24 hours to facilitate the removal of the pericarp (see, for example page 303, 'Materials and methods', 2nd paragraph).

Response to Arguments

1. Combining the cited references does not change their principle of operation

Applicant's arguments were considered to the extent they apply to the current rejection but were not persuasive. Applicant argues that Reichert et al teach methods to initiate organogenic callus cultures and uses media containing 2 auxins, but no cytokinin, and explicitly discuss the use of shoot induction media for organogenesis and not callus-induction media for callus formation (see page 7, 1st paragraph of 'Remarks' filed February 3, 2010).

This is not persuasive. The claimed method claims using an auxin and a cytokinin to produce a growing seedling containing a nodal section capable of producing callus. It does not indicate that the auxin and cytokinin are in the callus induction media. O'Connor-Sanchez et al teach germinating mature corn seed in MS basal media supplemented with the cytokinin BA and the auxin 2,4-D (see page 303, 'Materials and methods', 1st column, 2nd paragraph). It would have been obvious to one of ordinary skill in the art that a seedling would obviously contain a nodal section.

2. The references, as combined, provide an expectation of success

Applicant argues that there is no expectation of success to obtain embryogenic callus as claimed because Reichert uses media without cytokinin and O'Connor-Sanchez, even with the presence of auxin and cytokinin did not necessarily lead to organogenic callus cultures (see page 8, 1st paragraph to page 9, 2nd paragraph of 'Remarks' filed February 3, 2010).

This is not persuasive. One of ordinary skill in the art would have had a reasonable expectation of success because, as stated above, O'Connor-Sanchez et al teach germinating mature corn seed in MS basal media supplemented with the cytokinin BA and the auxin 2,4-D and in addition, O'Connor-Sanchez et al do teach that regenerable organogenic calluses can be induced to form embryogenic-like structures.

See *KSR International Co. v. Teleflex Inc.* (KSR), 550 U.S. ___, 82 USPQ2d 1385 (2007), where the Supreme Court particularly emphasized "the need for caution in granting a patent based on the combination of elements found in the prior art." It states "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at ___, 82 USPQ2d at 1395. The Supreme Court further stated that:

"When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Id.* at ___, 82 USPQ2d at 1396. The court also states "[t]he obviousness analysis cannot be confined by . . . overemphasis on the importance of

Art Unit: 1638

published articles and the explicit content of issued patents. . . . In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends.” KSR , 550 U.S. at ___, 82 USPQ2d at 1396.

“A person of ordinary skill in the art is also a person of ordinary creativity, not an automaton.” KSR International Co. v. Teleflex Inc., 550 U.S. ___, ___, 82 USPQ2d 1385, 1397 (2007). “[I]n many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” Id. Office personnel may also take into account “the inferences and creative steps that a person of ordinary skill in the art would employ.” Id. at ___, 82 USPQ2d at 1396.

3. All claim limitations have been considered

Applicant argues that “priming” a seed is well known to represent a change in the physiological state of a seed with respect to its ability to germinate and that “surface sterilization” is distinct from “seed priming” (see page 10, 1st paragraph of ‘Remarks’ filed February 3, 2010).

The Examiner agrees with Applicant’s explanation; however, the Examiner maintains that O’Connor-Sanchez does teach seed priming because they teach soaking seeds in bidistilled water for 24 h to facilitate removal of the pericarp, and to facilitate germination seeds were placed with the embryo side up (see page 303, ‘Materials and methods’, 2nd paragraph). The soaking in bidistilled water reads on priming.

Applicant argues that the claimed references do not teach “callus induction media” (see page 11, 2nd paragraph of ‘Remarks’ filed February 3, 2010).

This is not persuasive. O’Connor-Sanchez et al teach six culture media used to induce callus formation from explants (see, for example, page 303, ‘Materials and methods’, 2nd paragraph, 1st column, to 1st paragraph, 2nd column).

Conclusion

No claims are allowed.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEITH O. ROBINSON whose telephone number is (571)272-2918. The examiner can normally be reached Monday – Friday, 8:00 a.m. - 4:30 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached at (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Keith O. Robinson

/Ashwin Mehta/
Primary Examiner, Art Unit 1638